(19) World Intellectual Property Organization

International Bureau



(43) International Publication Date 15 July 2004 (15.07.2004)

PCT

(10) International Publication Number WO 2004/059139 A1

(51) International Patent Classification⁷: F02G 5/02, F01N 3/20

F01N 5/02,

(21) International Application Number:

PCT/IB2003/006163

(22) International Filing Date:

23 December 2003 (23.12.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2002-377862

26 December 2002 (26.12.2002)

2003-002338

8 January 2003 (08.01.2003)

(71) Applicant (for all designated States except US): TOY-OTA JIDOSHA KABUSHIKI KAISHA [JP/JP]; 1, Toyota-cho, Toyota-shi, Aichi-ken 471-8571 (JP).

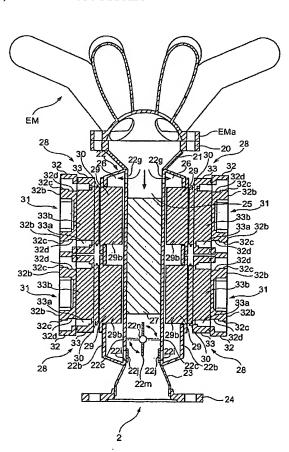
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): MURATA, Kiyohito

[JP/JP]; c/o Toyota Jidosha Kabushiki Kaisha, 1,toyota-cho, Toyota-shi, Aichi-ken 471-8571 (JP).

- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: EXHAUST SYSTEM



(57) Abstract: An exhaust system (1) is provided with an exhaust passage that allows exhaust gas discharged from an internal combustion engine to pass therethrough, an exhaust emission control unit including a catalyst (2,3) such as a three-way catalyst (27) to purify the exhaust gas, and an exhaust heat collecting unit that converts thermal energy of the exhaust gas into electric energy. The exhaust passage (25) is formed in the center of the exhaust system provided with the exhaust emission control unit. By-pass passages (26) are formed at both sides of the exhaust passage (25) through which the exhaust gas flows without passing through the exhaust emission control unit. The exhaust heat collecting unit (29) is provided on the outer side of each of the by-pass passages (26).